

A Strategy for IT Services

2020 - 2023

This document outlines key strategic themes for IT Services operations and developments over the period 2020-2023.

Volatility and rate of change in the IT sector means that identification of specific solutions, vendors or technologies is difficult.

Building for the Future

Generally, the University's IT environment is well managed and in a strong, stable position. However, numerous external influences, ever-increasing user expectations and an ambitious University strategy mean that the ongoing development of this environment is critical. The following pages outline a strategy that will ensure IT services and capabilities continue to be fit for purpose and provide the necessary support such that the institution can realise its ambitions.

Objectives

- Deliver the services necessary to support the day-to-day activities of a world-leading, research intensive University
- Develop new services and capabilities to enable the University to progress specific strategic priorities

Strategic Approach

- **Deliver appropriate services:** Continue to proactively manage a service catalogue, ensuring relevance to organisational needs and appropriate service performance.
Apply industry standard service management methods to ensure core services run as efficiently as possible. Monitor KPIs to ensure service performance and user satisfaction are maintained at desired levels
Amend services as changing University priorities and needs demand
- **Student and Community Voice:** Build on existing engagement with appropriate governance and strategic bodies within the University to ensure that IT Services are aware of priorities, emerging needs and user perceptions and experiences. Use these mechanisms to ensure resources are targeted to the most relevant and impactful projects and services. Establish new channels with research community.
- **High quality technology and partners:** Continue to invest in high quality, high performance technologies and partners. Where investment is required in order to maintain or develop capabilities, aim for services and partners commensurate with our wider ambitions and the profile of a world-leading organisation
- **Target resources:** Develop and apply appropriate governance mechanisms to ensure resources are targeted to essential core services and new services directly aligned to University objectives. Through governance mechanisms - minimise investment or activity on projects or services where there is weak alignment to University objectives
- **Prudent financial management:** Maintain a longitudinal budget forecast that indicates the likely investment profile necessary to maintain appropriate service levels

Principles of Operation

Specific projects and new service requirements will inform particular configurations of technology, but there are some thematic approaches that will be adopted across multiple projects and services. These can be considered as default starting positions for new developments:

- **Resource Management and Governance**

Outside of committed steady state service provision, IT Services has relatively little discretionary resource for new developments and projects. There is variation by team but approximately 70%-80% of resource is committed to core service delivery. Clearly, additional resource can be obtained for specific projects but the uncommitted 20% discretionary resource is highly valuable and in great demand. We employ a number of mechanisms to ensure this resource is allocated to the most beneficial projects.

With student experience and academic administration being a major source of demand the SPI Steering Group and Student Systems Group have oversight (and prioritisation) for all new projects affecting these areas. This probably accounts for >70% of discretionary activity in ITS. Outside of this area projects are required to have a business case signed off by the relevant University committee or department. If there is a conflict for resource the IT Prioritisation Board (Registrar, PVCs and senior Professional Services staff) determines where resource is to be allocated or to recommend additional resourcing.

- **Security**

Increasingly, cyber threat protection, data privacy and user protection (from self and others) will greatly influence technology choice and configuration.

Historically security recommendations may have been deprioritised against cost or usability considerations. Future projects will place greater importance and influence on security and it is likely that a number of projects updating existing systems will be initiated. It is likely that solutions that offer greater security will be preferred even if that commands a price premium or introduces minor irritations to user experience. Clearly pragmatism will be applied but a higher security standard will be adopted.

- **Cloud Services**

In the relatively recent past cloud based services were viewed as a novelty and with some degree of scepticism and risk aversion. 'Cloud' was viewed as 'second preference' approach to be considered for pilots and experiments. The situation has changed significantly.

Increasingly vendors offer cloud-only services with no provision for on premise licensing or deployment. Cloud services have matured considerably and many critical, core services are now provided as cloud based services as a matter of course.

Even where solutions are developed in-house, it is likely that many of those applications will be deployed on cloud based infrastructure.

The operational risks of this approach are fast diminishing (although still present) and there are numerous operational benefits to cloud based services, but other risks around increased long-term costs, security management and vendor lock-in are increasing.

Cloud adoption needs to be carefully managed but, increasingly, it will be the default starting position for vendor based solutions.

- **Development Methods**

Solutions will be implemented using both in-house and vendor approaches. Until relatively recently the University has been more comfortable with traditional water-fall type project management, typified (if slightly inaccurately) by the Prince2 type methodology. Increasingly we will encourage the use of agile, iterative development. This is most easily applied to in-house development, but there is also potential for it to be applied to package deployment.

In considering in-house versus package solutions we will maintain an open minded approach to technology selection – a balanced view across a number of years suggests both approaches offer stable, reliable solutions with comparable long-term support costs. However, it is the case that in-house solutions are better for solutions where there will be ongoing development and enhancement (continuous improvement) and package solutions best suited to standard, stable process with little differentiation or need for ongoing, frequent change.

Where there is a requirement for ongoing development to support continuous improvement, in-house solutions are considerably less expensive than vendor packages – however, it should be noted that investment in in-house support and development teams will be required.

Key Initiatives

Identifying specific projects introduces the risk that this strategic overview will quickly become obsolete – therefore, more persistent strategic themes are identified:

- **Invest in core infrastructure**

Replace our current network (now approaching 10 years old) in order to meet increased demands for high speed, high volume connectivity and sophisticated cyber-protection and data privacy

Expand and develop existing virtualised storage and hosting platforms in order to meet high volume/low cost data management needs.

Maintain current high-quality data centre facilities and expand use of cloud storage platforms – no requirement for additional data centre in next 5 years.

As necessary, provide technical infrastructure support for the introduction of 5G cellular network across campus and the region
- **Security and Data Governance**

Implement new advanced document and content protection services – isolating content from device vulnerabilities

Implement solutions for a new, expanded, virtualised desktop service (secure delivery/access of applications and data devices regardless of ownership or specification)

Implement mobile device management solutions

Exploit advanced security management provided by new network technology
- **New CRM and Engagement Environment support**

Support institutional strategies around student engagement, recruitment, regional engagement and leadership, community engagement. Reduce the number and complexity of existing engagement/transaction systems by implementing a single enquiry, engagement and transaction platform that will support staff and students throughout their entire period of engagement with the University. This platform also holds considerable potential for supporting commercial operations and teams.
- **Innovation Platform**

Expand the existing innovation support platform to allow wider and deeper engagement with students, staff and external organisations to capture innovative ideas and help progress ideas through to implemented solutions and commercial opportunities. Build a strategic partnership with a provider of ‘innovation process support’ platform – develop and enhance this platform.
- **Next Generation Digital Learning Platforms**

Complete the migration of departmental teaching resources and pathways on to a single, existing, institutional platform (Moodle VLE). Through consultation with practitioners and sector leaders prepare for a transformation to next-generation learning support tools (Moodle 2++; 3-5 years)
- **Next Generation Student Administration Platform**

Prepare for the retirement of the current core student records system (5-7 years); identify suitable alternative solutions (including migrating to current vendors ‘next-gen’ solution) and complete process reengineering and migration

Risks and Issues

- **Organisational structure**

This strategy is reliant on strong, effective communications channels with all departments and teams. There is a risk that ineffective communications will result in lack of awareness of need, out-of-date services and solutions. An internal communications strategy must be developed and maintained.
- **Currency risks**

A number of suppliers base their equipment price lists on US dollar price-lists. While prices are

quoted in sterling and fixed once an order or contract is placed, until orders are placed or at the time of contract renewal there is a risk of price increases due to currency fluctuations. Of course, currency fluctuations could have a beneficial effect, but that has not been our experience to date. There is a short term Brexit influence on this risk – although it may become less volatile as Brexit passes.

- **Supply chain risk**

Components within key pieces of equipment can become difficult to obtain, occasionally leading to extended lead times. This is often seen in business-class computers where specific chip-sets can be in very short supply. While inconvenient for end-user devices it is unlikely that we will encounter this issue for our core infrastructure due to the level of resilience and supply chain management offered by our chosen manufacturer.

Of more concern might be the increasing sensitivity on export controls for high-end equipment. Many components, even for core infrastructure, are manufactured in China. With high-end equipment dominated by US suppliers, if the US Government tightened export controls and licensing it is possible that high-performance or high-sensitivity technology could become difficult to obtain. While it might be reasonable to anticipate that manufacturers would set-up alternative supply routes and that the UK might be granted access to such equipment, it is possible significant delays could be introduced. The only possible mitigation for such an event would be locally stored spare equipment – this would be very expensive (as we are considering here the highest performance, most advanced components). Given the costs involved, the likelihood of this occurring and our levels of resilience it is proposed that we do not acquire spare equipment at this time.

This risk is not particularly linked to Brexit, a greater influence is the stance adopted by the US on advance technology licensing to Far East manufacturers.

- **Subscription and business model changes**

There is a clear shift by vendors to subscription type models. Many vendors no longer offer an 'on premise' or perpetual license model.

While the subscription model has many attractive features – surety of payments, ease of scaling – there is little doubt that over the long term the overall costs of services are higher. Unfortunately, there seems to be no realistic mitigation to this change – vendors are exploiting cloud-based services to force organisations on to their preferred models.

Green agenda

Generally speaking, any growth in infrastructure capacity comes with an increase in power consumption and raw material usage. Ideally, it is better to avoid the need for storage/hosting/connectivity etc., rather than finding more efficient ways to operate it. However, accepting some growth is unavoidable, and that newer equipment tends to be more efficient, it is felt that continued investment will allow services to become more efficient and environmentally sustainable.

The two main data centres are relatively new and operate at an efficiency rating of 1.35 and 1.15 PUE. Equipment within the data centres (and used in multiple communications rooms across campus) is at the higher end of performance and efficiency (when purchased). Appropriate refresh cycles ensure both reliability, lower maintenance costs and, of course, improved efficiency. For example, the proposed refresh of the network will not only introduce more efficient equipment but will also reduce the number of communication rooms and distribution switches.

It is the view of IT Services that the greatest potential for improved energy efficiency, (and improvements in data security), lies in the migration to central services of data/applications from old, inefficient and, occasionally, insecure stand-alone equipment in labs, offices and local server rooms. Consolidating data/applications on to shared platforms not only eliminates inefficient equipment and local risk, but allows more efficient running of shared platforms, (a highly-utilised data centre is more efficient than a sparsely populated one). It is accepted that for such migration to occur, shared services must be of high quality and fit-for-purpose. At present there is no formal policy for departmental staff to use central services – either for new projects or for transferring existing services, this is a weak point in our strategy. Rather than seeking a mandate to force users on to central services, it might be useful to consider introducing a 'default' expectation that central services will be used unless an exception is granted by a

relevant review group. This would provide the opportunity for central services to remind or inform users of up-to-date capabilities of which they may not be aware. Equally, it would provide an opportunity for users to request or suggest improvements to central services that would allow them to more easily use the service. This approach could be applied to data storage, application and server hosting and individual computing devices (PCs, Macs, tablets, phones, etc.). It is worth noting that the new network has capabilities that would prevent local servers from being connected to sensitive applications – in effect they could be quarantined – this manages security risk but does not address efficiency concerns.

Key Financial Highlights

The following summary provides an overview of major financial investments.

2019 IT CAPITAL PLAN											
Description	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	TOTAL
	£'000	£'000	£'000	£'000	£'000	£'000	£'000	£'000	£'000	£'000	£'000
Servers, Storage & Back-Up	3,100	1,290	1,590	1,785	605	4,555	1,165	2,250	1,680	820	18,840
Data Centres	100	75		265	85		240		95		860
Network, Telecoms. IT Security	14,808	947	1,240	255	535	8,545	315		290	605	27,540
Total 2019 Plan	18,008	2,312	2,830	2,305	1,225	13,100	1,720	2,250	2,065	1,425	47,240

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